

Tribhuvan University
Institute of Science and Technology
2081
☆

Bachelor Level / Third Year /Six Semester/Science
Computer Science and Information Technology (CSC 365)
(Compiler Design and Construction)
(NEW COURSE)

Full Marks: 60
Pass Marks: 24
Time: 3 hours.

Candidates are required to give their answers in their own words as far as practicable.
The figures in the margin indicate full marks.

Section A

Attempt any TWO questions.

[2×10=20]

1. Discuss about Directed Acyclic Graph with an example. Represent the expression $A = (B + C) - (D - E * F)$ using 3AC, Quadruple and Triples. [3 + 7]
2. Create the LR(1) parsing table for following grammar. [10]
 $S \rightarrow AA$
 $A \rightarrow 0A$
 $A \rightarrow 1$
3. Explain the optimization techniques for code optimization. Convert the following program to basic block and control flow. [6 + 4]

```

M = A + B
N = C + D
IF(M > N)
{
    X = M - N;
}
ELSE
{
    X = M + N;
}
E = M + N + X

```

Section B

Attempt any EIGHT questions.

[8 × 5 = 40]

4. Compute the FIRST and FOLLOW of all the non – terminals in following grammar. [5]
 $S \rightarrow AB$
 $A \rightarrow 0A' \mid 1A' \mid \epsilon$
 $A' \rightarrow SSA' \mid \epsilon$
 $B \rightarrow AS \mid 1$
5. What are the operations performed in symbol table? Discuss about activation tree. [2.5 + 2.5]
6. What are the roles of macros and preprocessor? Discuss about one pass and multi pass compiler. [2 + 3]
7. Define explicit and implicit type conversion. Why do we need to check type of the system? Justify with an example. [2 + 3]
8. Differentiate between synthesized and inherited attributes with example. [5]

CSC365-2081 ☆

✓ 9. Construct the LL(1) parsing table for following grammar. [5]

$S \rightarrow AS1 \mid C$

$A \rightarrow 0$

$C \rightarrow 2C \mid \epsilon$

✓ 10. What are the advantages of intermediate code? How to you convert procedure call to 3AC? - [2 + 3]

✓ 11. What is symbol table? Discuss the general structure of LR parser. [1 + 4]

○ 12. Generate the LR(0) item sets for following grammar. [5]

$A \rightarrow BB$

$B \rightarrow bB \mid a$